

Notice of Allowability

Application No.

10/082,647

Examiner

John Pezzlo

Applicant(s)

PAUL ET AL.

Art Unit

2662

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to IDS filed 28 May 2002.
2. ☒ The allowed claim(s) is/are 1-27.
3. ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☒ All b) ☐ Some* c) ☐ None of the:
 1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).


* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 28 May 2002
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☒ Other See Continuation Sheet.


JOHN PEZZLO
PRIMARY EXAMINER

Continuation of Attachment(s) 9. Other: Drawings filed 25 February 2002 are accepted..

DETAILED ACTION

Allowable Subject Matter

Claims 1-27 are allowable over the prior art of record.

Reasons for Allowance

The following is an examiner's statement of reasons for allowance: Applicants have claimed uniquely distinct features in the instant invention, which are not found in the prior art, either singularly or in combination. Each independent claim identifies the following uniquely distinct features:

1. Regarding claim 1 – Method for configuring a Trie-type associative memory for the processing of data packets based on a set of rules, the Trie memory being used for analyzing binary strings situated at defined locations in each data packet, whereby each rule attributes an action to a packet based on the values of the binary strings, wherein the Trie memory includes registers made up of a defined number of individual cells for receiving respective references, the method comprising the steps of translating the set of rules into a packet analysis tree, comprising nodes distributed into successive stages respectively associated with the locations considered in a defined order, arcs and leaves corresponding to actions which can be attributed by the rules, the first stage of the tree comprising a single node called root node of the analysis tree, each arc having start node and an arrival point consisting either of a node of the stage following that of

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said start node or of leaf, and being associated with respective domain binary string values possible at said location, the analysis tree defining paths each consisting of a series of arcs, an integer at least equal to 1, the first arc of the series having as start node the root node the analysis tree, the arrival point of each arc of a path other than the last arc being the start node of the following arc of said path, and the arrival point the last arc of the path being a leaf corresponding to an action attributed according to set of the rules each packet having, at the n locations associated respectively with the stages of the start nodes of the n arcs of said path, binary string values falling into the domains associated respectively with said arcs, allocating a group of registers of the Trie memory, including a gatekeeper register, to each node of the analysis tree belonging to a stage associated with a location, and recording references in the cells of the group of registers such that, by analyzing from the gatekeeper register the binary string value contained at said location in a packet, a final reference obtained depending on which domain contains the value from among the domains of values associated with the arcs having said node as start node and such that: if the arc associated with the domain containing the value has, as arrival point, a leaf corresponding to an action, the final reference designates the action as being attributed to the packet, and if the arc associated with the domain containing the value has another node of the following stage as arrival point, the final reference designates said other node so as to carry on by analyzing the binary string value contained in the packet at the location associated with said following stage.

2. Regarding claim 12 – A device for processing data packets, comprising a Trie-type associative memory for the analysis of binary strings situated at defined locations in each data packet, and a controller for configuring the Trie memory for the processing of the data packets

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on the basis of a set of rules, whereby each rule attributes an action to a packet based on values of the binary strings, the Trie memory including registers made up of a defined number of individual cells for receiving respective references, wherein the controller comprises means for translating the set of rules into a packet analysis tree, comprising nodes distributed into successive stages respectively associated with the locations considered in a defined order, arcs and leaves corresponding to actions which can be attributed by the rules, the first stage of the tree comprising a single node called root node of the analysis tree, each arc having a start node and an arrival point consisting either of a node of the stage following that of said start node or of a leaf, and being associated with a respective domain of binary string values possible at said location, the analysis tree defining paths each consisting of a series of n arcs, n being an integer at least equal to 1, the first arc of the series having as start node the root node of the analysis tree, the arrival point of each arc of a path other than the last arc being the start node of the following arc of said path, and the arrival point of the last arc of the path being a leaf corresponding to an action attributed according to the set of the rules to each packet having, at the n locations associated respectively with the stages of the start nodes of the n arcs of said path, binary string values falling into the n domains associated respectively with said arcs, means for allocating a group of registers of the Trie memory, including a gatekeeper registers to each node of the analysis tree belonging to a stage associated with a location, and for recording references in the cells of the group of registers such that, by analyzing from the gatekeeper register the binary string value contained at said location in a packet, a final reference is obtained depending on which domain contains the value from among the domains of values associated with the arcs having said node as start node and such that: if the arc associated with the domain containing the

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value has, as arrival point, a leaf corresponding to an action, the final reference designates the action as being attributed to the packet, and if the arc associated with the domain containing the value has another node of the following stage as arrival point, the final reference designates said other node so as to carry on by analyzing the binary string value contained in the packet at the location associated with said following stage.

The closest prior art, either singularly or in combination, fail to anticipate or render the above limitations obvious.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

Claims 1-27 being allowable, **Prosecution On The Merits Is Closed** in this application.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

1. Wilkinson, III et al. (6,014,659) discloses compressed prefix matching database searching.
2. Wilkinson, III et al. (5,781,772) discloses compressed prefix matching database searching.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Pezzlo whose telephone number is (571) 272-3090. The examiner can normally be reached on Monday to Friday from 8:30 AM to 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hassan Kizou, can be reached on (571) 272-3088. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-2600.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C.

or faxed to:

(571) 273-8300

For informal or draft communications, please label "PROPOSED" or "DRAFT"

Hand delivered responses should be brought to:


Jefferson Building

500 Dulany Street

Alexandria, VA.

John Pezzlo

15 November 2005


JOHN PEZZLO
PRIMARY EXAMINER